

TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No.
R.37564In Re Application Of: **Walter KULOVITS et al**

AUG 02 2004

Application No. 09/937,309	Filing Date January 4, 2002	Examiner D. Hwu	Customer No. 02119	Group Art Unit 3752	Confirmation No. 7886
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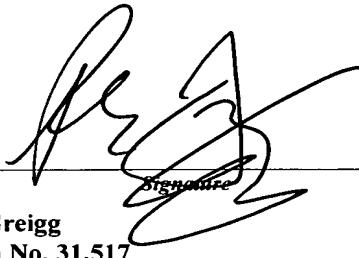
Invention: FUEL INJECTION VALVE FOR INTERNAL COMBUSTION ENGINES, AND A METHOD FOR PRODUCING SAME

COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on June 4, 2004.

The fee for filing this Appeal Brief is: **\$330.00**

- A check in the amount of the fee is enclosed.
- The Director has already been authorized to charge fees in this application to a Deposit Account.
- The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 07-2100



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Dated: **August 2, 2004**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re patent application of

Confirmation No. 7886

Walter KULOVITS et al.

Before the Board of Appeals

Serial No. 09/937,309

Art Unit: 3752

Filed: January 4, 2002

Examiner: D. Hwu

For: Fuel Injection Valve For Internal Combustion Engines, And A Method For
Producing The Same

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Date: August 2, 2004

APPELLANT'S BRIEF (37 CFR 1.192)

Sir:

This Brief is filed in support of the Notice of Appeal filed on June 4, 2004,
appealing the Examiner's decision of making final a rejection of claims 8-14.

This Brief is transmitted in triplicate.

The fee for this Appeal Brief of \$330 should be charged to Deposit Account No.
07-2100 by the attached deposit account form, submitted in duplicate.

I - REAL PARTY IN INTEREST

The real party in interest in this appeal is:

08/03/2004 HGUTEMA1 00000073 072100 09937309
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II - RELATED APPEALS AND INTERFERENCES

With respect to other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in this appeal, there are no such appeals or interferences. None

III - STATUS OF CLAIMS

A. TOTAL NUMBER OF CLAIMS IN APPLICATION - Seven (7)

Claims in the application are: 8-14.

B. STATUS OF ALL THE CLAIMS

1. Claims canceled: 1-7
2. Claims withdrawn from consideration but not canceled:
None.
3. Claims pending: 8-14.
4. Claims allowed: None.
5. Claims rejected: 8-14.

C. CLAIMS ON APPEAL

The claims on appeal are: 8-14.

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IV. STATUS OF AMENDMENTS

No amendments were filed subsequent to the final rejection mailed on March 10, 2004.

V. SUMMARY OF THE INVENTION

A fuel injection valve for internal combustion engines comprising a valve retaining body or part (1) having a longitudinal axis and in which a central hollow chamber (5) is embodied. A spring or a hydraulic or magnetic device (6) disposed in the hollow chamber (5) that transmits a force to a valve member (30). An inlet conduit (3) extends in the wall of the central hollow chamber (5) parallel to the longitudinal axis (2) of the valve body part (1). By way of the inlet conduit (3), fuel at high pressure can be delivered to at least one injection opening (36). The inlet conduit (3) in the circumferential direction having a greater length than in an at least approximately radial direction. Specification, pages 5 and 8.

A method for producing a valve body part (1) of a fuel injection valve comprising the steps of: in an at least approximately cylindrical body, a bore forming the inlet conduit (3) is embodied eccentrically and at least approximately parallel to the longitudinal axis (2) of the conduit; reducing the diameter of the body, while maintaining its at least approximately cylindrical shape, by plastic deformation, until a predetermined diameter is attained, and the cross section of the bore is changed in such a way that the cross section has a greater length in the circumferential

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direction than in the at least approximately radial direction; and forming the central hollow chamber (5) in the body so that the inlet conduit (3) extends in the wall of the central hollow chamber (5). Specification, page 3, lines 6-18 and page 8, line 1-18.

VI. ISSUES

1. Whether claims 8-11 are unpatentable under 35 U.S.C. 103(a) over Regueiro (US 5,353,992) in view of Imura et al (US 5,022,372).
2. Whether claims 12-14 are unpatentable under 35 U.S.C. 103(a) as unpatentable over Regueiro in view of Imura et al in combination with Muzslay (US 5,989,076).

VII. GROUPING OF THE CLAIMS

With respect to Issue 1, claims 8-11 stand or fall together. With respect to Issue 2, claims 12-14 stand or fall together.

VIII. ARGUMENTS

Issue 1.

Claims 8-11 are not unpatentable under 35 U.S.C. 103(a) over Regueiro view of Imura et al.

Applicants have invented a fuel injection valve for internal combustion engines having a more slender design compared to conventional fuel injection

valves, but which maintains the necessary wall thickness between the spring chamber and the fuel inlet conduit. This is accomplished by reducing the dimensions of the inlet conduit in the radial direction while increasing the length of the conduit in the circumferential direction.

Independent claim 8 is directed to a fuel injection valve for internal combustion engines comprising, inter alia, a valve body part having a longitudinal axis and in which a central hollow chamber is embodied, an inlet conduit, which extends in the wall of the central hollow chamber parallel to the longitudinal axis of the valve body part, said inlet conduit in the circumferential direction having a greater length than in an at least approximately radial direction.

The examiner has determined that Regueiro shows all of the fuel injection valve structure recited in claim 8, except an inlet conduit in the circumferential direction having a greater length than in an at least approximately radial direction.

To solve this deficiency in Regueiro, the examiner cites Imura et al. as teaching a fuel delivery system comprising a rectangular fuel delivery passage. The examiner then concludes that it would have been obvious to have modified the device of Regueiro by providing inlet conduit (51) which in the circumferential direction having a greater length than in an at least approximately radial direction "as taught by Imura et al, since Imura et al teaches that such passage shapes are known in the art and the device of Regueiro would function properly with a fuel passage having such a shape."

However, Imura et al teaches a fuel delivery rail comprising an elongated conduit having a rectangular or square cross section. A fuel rail supplies fuel to an injection valve. It is not a fuel injection valve. There is no teaching or suggestion in Imura et al of an inlet conduit in a valve body part or any teaching or suggestion of making such an inlet conduit rectangular or square and orienting the conduit so that the inlet conduit has a greater length in the circumferential direction than in the radial direction of the valve body. What is actually disclosed by Imura et al is a fuel delivery rail having a rectangular or square hollow section. Imura is not concerned with the wall thickness of an injection valve and, in fact, has no teaching relevant to injection valve design.

Even if Imura were relevant to fuel injection valve design, Imura provides no teaching or suggestion of how the square or rectangular conduit would be oriented when combined with an injection valve body. Simply making Regueiro's conduit (51) rectangular or square does not necessarily lead one to applicants' invention. One must also orient the rectangular passage such that the long side is in the circumferential direction of the valve body. Where is this teaching in the applied prior art? The answer is that it simply does not exist.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). See, also, MPEP 2143.03. Neither Regueiro nor Imura et al teaches or suggests a fuel injection valve of the type recited in claim 8 in

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which the inlet conduit in the circumferential direction has a greater length than in an at least approximately radial direction. Accordingly, claim 8 is not rendered obvious by the combined teachings of Regueiro and Imura et al.

As to the specific shapes recited in claims 9-11, the examiner takes the position that the oval or elliptical shape of the inlet conduit is an obvious matter of design choice. The applicants' specification has set forth specific advantages of an injection valve inlet conduit having an approximate oval or elliptical shape oriented in a specific manner relative to the longitudinal axis of the valve body, namely, it allows a fuel injection valve to be fabricated with a more slender design compared to conventional fuel injection valves while still maintaining the necessary wall thickness between the spring chamber and the fuel inlet conduit. See, spec., p. 2, l. 20 through p. 3, l. 5. No such teaching or suggestion exists in the applied prior art. Thus, the results achieved by applicants' design were unexpected in the art and the specific shapes called for in claims 9-11 were not merely matters of design.

Issue 2.

Claims 12-14 are not unpatentable under 35 U.S.C. 103(a) over Regueiro in view of Imura et al in combination with Muzslay.

Applicants' specification (page 8) teaches that the fuel inlet conduit of the invention can be produced by the following method: A bore which has a circular cross section is made eccentrically to a cylindrical body, which is solid and

preferably comprises metal, the bore being at least approximately parallel to the longitudinal axis of the cylindrical body. The cylindrical body has an outer diameter that is greater than the predetermined value of the valve retaining body 1 to be produced. By mechanical machining, the cylindrical body is then plastically deformed, so that while maintaining its cylindrical shape of the outer jacket face or surface, it is reduced in diameter, until the predetermined value of the valve retaining body 1 to be produced is attained. As a result, the cross section of the inlet conduit 3 is changed as well and assumes an oval or elliptical cross-sectional contour. After this deformation, a central hollow chamber forming the spring chamber 5 is embodied in the valve retaining body 1, so that the inlet conduit 3 extends in the wall of the spring chamber 5. The plastic deformation of the cylindrical body is advantageously done by rolling of the cylindrical body, making a permanent plastic reshaping of the cylindrical body possible while maintaining its cylindrical shape of the outer jacket face.

Independent claim 12 is directed to a method for producing a valve body comprising, inter alia, the step of “reducing the diameter of the body, while maintaining its at least approximately cylindrical shape, by plastic deformation, until a predetermined diameter is attained, and the cross section of the bore is changed in such a way that the cross section has a greater length in the circumferential direction than in the at least approximately radial direction.”

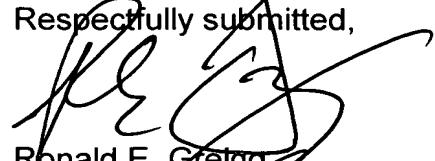
The examiner acknowledges that neither Regueiro nor Imura et al teaches or suggests a method for producing a valve body including the above identified step. According to the examiner, "Muzslay teaches the process of plastic deformation in order to shape a tube of a fuel injector." This is not a correct description of what is taught by Muzslay. Muzslay actually teaches a fuel injection housing and connector assembly 10 comprising a metal housing 12 and an injection molded plastic connector frame 14. In order to increase the strength of the connector frame, a metal brace 70 in the form of a sleeve is positioned in a cavity 32 in the metal housing before the plastic material is injected into the cavity to form the connector frame. There is no teaching of plastic deformation in Muzslay, much less a teaching of reducing the diameter of a cylindrical body, while maintaining its at least approximately cylindrical shape, by plastic deformation, until a predetermined diameter is attained, and the cross section of a bore in the cylindrical body is changed in such a way that the cross section has a greater length in the circumferential direction than in the at least approximately radial direction. Thus, all the claim limitations are not taught or suggested by the applied prior art. Therefore, claims 12-14 are not rendered obvious by the combined teaching of Regueiro, Imura et al and Muzslay.

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IX - APPENDIX OF CLAIMS

An appendix of the claims in this application is attached.

Respectfully submitted,


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CLAIMS ON APPEAL

8. A fuel injection valve for internal combustion engines comprising a valve body part (1) having a longitudinal axis and in which a central hollow chamber (5) is embodied, means (6) disposed in said hollow chamber (5) that transmits a force to a valve member (30), and an inlet conduit (3), which extends in the wall of the central hollow chamber (5) parallel to the longitudinal axis (2) of the valve body part (1), and by way of which inlet conduit (3), fuel at high pressure can be delivered to at least one injection opening (36), said inlet conduit (3) in the circumferential direction having a greater length than in an at least approximately radial direction.
9. The fuel injection valve of claim 8, wherein said inlet conduit (3) has an at least approximately oval cross section.
10. The fuel injection valve of claim 9, wherein the two points of the oval cross section located farthest apart from one another in the inlet conduit (3) have at least approximately the same spacing from the longitudinal axis (2) of the valve body (1).
11. The fuel injection valve of claim 9, wherein said oval cross section of the inlet conduit (3) at least approximately forms an ellipse.

12. A method for producing a valve body part (1) of a fuel injection valve of claim 8, comprising the steps of

- in an at least approximately cylindrical body, a bore forming the inlet conduit (3) is embodied eccentrically and at least approximately parallel to the longitudinal axis (2) of said conduit;

- reducing the diameter of the body, while maintaining its at least approximately cylindrical shape, by plastic deformation, until a predetermined diameter is attained, and the cross section of the bore is changed in such a way that the cross section has a greater length in the circumferential direction than in the at least approximately radial direction; and

- forming the central hollow chamber (5) in the body so that the inlet conduit (3) extends in the wall of the central hollow chamber (5).

13. The method of claim 12, wherein said body forming the valve body part (1) is of metal, preferably steel.

14. The method of claim 13, wherein the steps of plastic deformation of the cylindrical metal body is accomplished by rolling.